



Summer 2009
Volume 7, Issue 2

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Hitting the Century Mark

by Jim Allsopp, Warning Coordination Meteorologist

Most people in the Chicago and Rockford areas consider it “hot” once the temperature climbs into the 90s. But hitting 100 degrees is sort of an unofficial benchmark for extreme heat in this part of the world. Triple digit temperatures are a rarity, having only occurred 61 times in 137 years of official weather records for Chicago, and 101 times in 104 years of records in Rockford.

Rockford’s official records date back to the spring of 1905, although there is some incomplete data that goes into the 1890s. Chicago’s official records began in the fall of 1871, but the early observations were taken downtown or at the University of Chicago, under the cooling influence of Lake Michigan. Observations began in 1928 at Midway Airport, and Midway became Chicago’s official climate station beginning in July of 1942. The official observatory was moved to O’Hare Airport in 1980. Just using data from Midway from 1928 through 1980, and O’Hare from 1980 to present, there have been 78 days with a temperature of 100 or greater in 81 years.



But weather extremes don’t occur on a regular basis. They tend to come in spurts. For both cities, the “Dust Bowl” summers of the mid 1930s were a time of unprecedented heat. Rockford recorded 44 days in the 100s in the 1930s, including 11 in 1934 and 15 during the torrid summer of 1936. The city baked under 9 straight days of 100 degree heat from July 6 through July 14, 1936. In Chicago during the 1930s, there were only 9 days in the 100s officially near the Lake, but a look at the unofficial temperature data from Midway tells a different story. Midway had 37 days in the 100s during the decade, with 11 each in 1934 and 1936. Another intensely hot summer was 1988. Chicago (O’Hare) and Rockford each recorded 7 days in the 100s.

But there have also been some very long 100 degree droughts. Rockford went almost 32 years from July 1, 1956 until June 20, 1988 without a 100 degree day. The last time Rockford recorded 100 degrees was July 10, 1989, almost 20 years ago. Chicago has gone 15 years from 1872 to 1887 without a 100 degree day, 14 years from 1887 to 1901, and 12 years from 1918 to 1930. Since moving the observation site away from the lakefront, Chicago’s longest stretch



without a 100 degree temperature was 11 years from 1960 to 1971. The most recent 100 degree day in Chicago was July 24, 2005.

Rockford's all-time temperature extreme was 112 on July 14, 1936. Chicago's official all-time high was 105, which occurred on July 24, 1934. However, Midway unofficially hit 109 on July 23, 1934.

Kids cool off at Crown Fountain in Chicago's Millennium Park.



Summertime is Beach Time — Check the Forecast for the Beach

by Tim Seeley, Marine Program Leader

Memorial Day weekend traditionally marks the beginning of summertime, and summertime means heading to the beach. For those brave enough to enter the still chilly waters of Lake Michigan it also signals the beginning of the lake wading and swimming season.

Your National Weather Service Forecast Office in Chicago/Romeoville will be issuing a Surf Zone Forecast, or Beach Forecast, starting this Memorial Day weekend, and continuing through the end of September. The Surf Zone Forecast will consist of information on sky condition, precipitation, temperatures, winds, waves, and an assessment of the rip current threat for Lake Michigan beaches of Lake IL, Cook, Lake IN, and Porter Counties. This includes the beaches of Illinois State Beach Park, the City of Chicago Park District, and the Indian Dunes National Lakeshore.

Rip Currents are channeled currents of water flowing away from shore. Under certain wind and wave conditions these currents can be numerous and strong. The northwest Indiana and southwest lower Michigan shorelines are prone to rip currents, especially on days when there are large waves or when strong, fast moving, gusty thunderstorms move in off the lake, continuing for a period even after skies clear as minor seiches can be generated that can add to rip current development. In addition, winds blowing parallel to the shoreline can lead to localized strong rip currents near piers, break walls and other structure that extend out into the lake.



People planning to go Lake Michigan beaches to swim or wade this summer should check the Rip Current Outlook in the Surf Zone Forecast and always obey lifeguards, park rangers, posted signs and warning flags regarding the potential danger of entering Lake Michigan waters. Many drownings due to rip currents have been the result of the victims ignoring these warnings and beach closing notices.

When the potential of rip currents is elevated to the moderate or high category, this information will also be included in the Hazardous Weather Outlook as well as the Lakeshore Hazard Message products issued by the Chicago/Romeoville NWS office. For those heading to the southwest lower Michigan shores, rip current information and beach conditions are available from the NWS Northern Indiana and NWS Grand Rapids offices.

The Rip Current Outlook in NWS products will use the following 3-tiered text qualifiers...

Low Risk... Wind and/or wave conditions are not expected to support the development of Rip Currents. However, Rip Currents can sometimes occur, especially in the vicinity of jetties, break walls, and piers. Know how to swim and heed the advice of Lifeguards.

Moderate Risk... Wind and/or Wave conditions support stronger or more frequent Rip Currents. Only experienced swimmers should enter the water.

High Risk... Wave conditions support dangerous Rip Currents. Rip Currents are life-threatening to anyone entering the water.

The Surf Zone/Beach Forecast for the Illinois and Indiana lakeshore can be found here...

www.crh.noaa.gov/product.php (from the main NWS Chicago/Romeoville menu bar, under the *Forecasts* section, click on *Local Area*, then under *Latest Forecasts for Northern Illinois and Northwest Indiana* section click *Lake Michigan Beach Forecast* for Illinois and Indiana.

Specifics on the product identifiers for the new Surf Zone Forecasts in the Great Lakes can be found here...

www.weather.gov/os/notification/scn09-17surf_great_lakes-1.txt

For more information on rip currents, visit NOAA's Rip Current Safety web page at www.ripcurrents.noaa.gov and the National Park Service Indiana Dunes National Lakeshore Rip Current information web page at www.nps.gov/archive/indu/rip.htm.

Have a fun and safe day at the beach.

New River Forecast and Flood Warning Services

by Bill Morris, Service Hydrologist

On March 5, 2009, flood forecasts became available for the Illinois River at Ottawa, IL. River forecasts and flood warnings became a reality for Ottawa thanks to a cooperative effort between the National Weather Service, Rock Island Corps of Engineers, Ottawa High School officials and others in Ottawa. River forecasts will be issued for Ottawa when water levels are expected to reach or exceed the action stage of 461.0 feet. Flood stage is 463 feet. Flood warnings are issued when water levels are expected to reach or exceed the 463 feet flood stage. It should be noted that water levels for the new gage at Ottawa, like many other lock and dams on the Illinois River, are reported in Mean Sea Level. It does not imply that the water depth is 400+ feet deep!

New flood warning and river forecast services also became available for the Fox River at Montgomery, IL. Flood forecast services for Montgomery are based on a gage operated by the US Geological Survey. Flood stage is 13 feet.

River gage information and forecasts during high water are available on the [NWS Chicago Advanced Hydrologic Prediction Service](#) (AHPS) web site. Flood warnings are also broadcast over the NOAA Weather Radio.

Lightning Fatalities

by Jim Allsopp, Warning Coordination Meteorologist

Summer is a time of year when many people are outdoors working and playing. But it is also the time of year when thunderstorms are most frequent. The following national lightning fatality statistics for 2008 were compiled by John Jensenius, NWS Portland Maine.

Number	Date	Day of Week	State	City	Age	Sex	Location	Activity
01	1/11/2008	Friday	SC	Aiken	56	F	Outside, near building	Taking a break from work
02	2/5/2008	Tuesday	OH	Lewisville	60	M	Open field	Tending cows
03	5/22/2008	Thursday	AR	Little Rock	17	M	Under tree	Standing outside house
04	5/24/2008	Saturday	KS	Vassar	20	M	Under trees	Camping
05	6/7/2008	Saturday	CT	Madison	23	M	Pavilion	Seeking shelter from rain
06	6/11/2008	Wednesday	IA	Curlew	20	M	In yard at home	
07	6/14/2008	Saturday	PA	Tobyhanna	17	M	Lake	Swimming
08	6/15/2008	Sunday	FL	Bristol	6	F	Under tree	Camping
09	6/20/2008	Friday	MA	Haverhill	47	M	Under trees	Hiking in park
10	6/21/2008	Saturday	FL	Choctaw Beach	21	M	In boat on bay	Fishing
11	6/21/2008	Saturday	FL	Choctaw Beach	17	M	In boat on bay	Fishing
12	6/24/2008	Tuesday	RI	Bristol	42	M	On jetty	Fishing
13	6/26/2008	Thursday	OH	Collins	51	F	In yard under tree	Walking
14	7/3/2008	Thursday	CO	Westcliffe	16	M	Outside open	Riding bicycle
15	7/5/2008	Saturday	SC	Columbia	19	M	On lake	Riding jet ski
16	7/6/2008	Sunday	VA	Virginia Beach	23	F	On beach	Jogging

Number	Date	Day of Week	State	City	Age	Sex	Location	Activity
17	7/7/2008	Monday	WI	Watertown	16	M	Under tree in yard	
18	7/7/2008	Monday	NC	Lea Island	16	M	Under beach house	Boating-fishing / taking shelter
19	7/13/2008	Sunday	MS	Centreville	38	M	Under tree	Talking with others
20	7/13/2008	Sunday	FL	Pensacola Beach	25	M	Near water	Seeking shelter from storm, had been on boat
21	7/15/2008	Tuesday	TX	Grand Prairie	22	M	Open/near lake	Camping, packing vehicle to leave
22	7/18/2008	Friday	ME	Standish	22	M	Outside house	Retrieving eye glasses
23	7/18/2008	Friday	ME	Standish	28	F	Outside house	Retrieving eye glasses
24	7/24/2008	Thursday	CO	Fort Collins	35	M	Under trees	
25	7/24/2008	Thursday	CO	Fort Collins	33	M	Under trees	
26	7/27/2008	Sunday	NJ	Sandy Hook	38	M	On beach	
27	7/28/2008	Monday	CO	Creede	23	M	Open mountain ridge	Shepherd riding mule
28	9/14/2008	Sunday	MO	Ladue	49	F	Outside house, under tree	Tree branch struck by lightning fell on her

2008 National Lightning Fatality Demographics

By State

In 2008, lightning deaths occurred in 19 states. Florida and Colorado led the nation with 4 fatalities. South Carolina, Maine, and Ohio had 2 fatalities each.

Florida	4
Colorado	4
Ohio	2
South Carolina	2
Maine	2
Kansas	1
Arkansas	1
Connecticut	1
Iowa	1
Pennsylvania	1
Rhode Island	1
Massachusetts	1
Virginia	1
Wisconsin	1
North Carolina	1
Mississippi	1
Texas	1
New Jersey	1
Missouri	1

By Sex

In 2008, about 80% of the fatalities were male.

Male – 22 (79%)

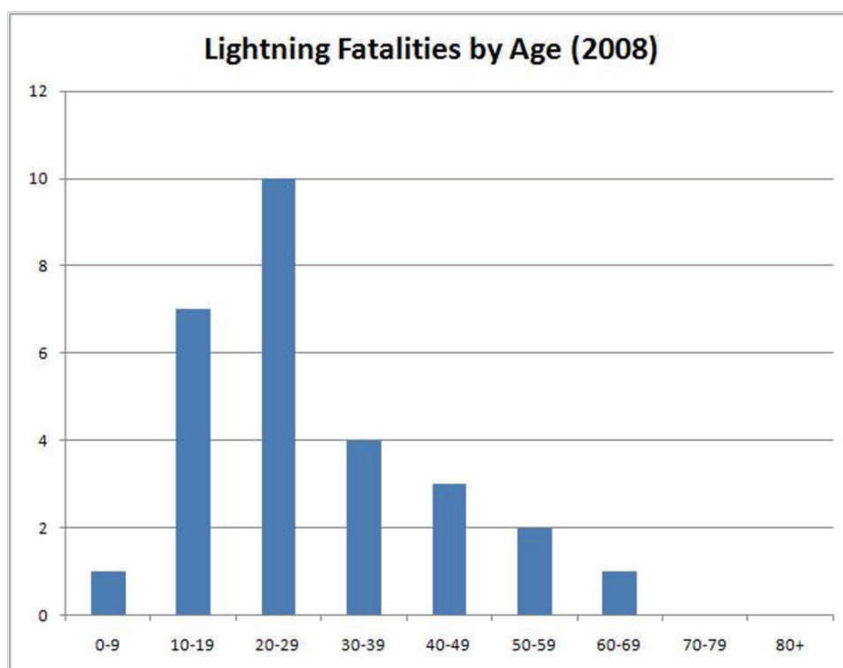
Female – 6 (21%)

By Age

In 2008, the majority of lightning victims were young. Almost 65% of the victims were under the age of 30.

Unknown	1	(4%)
0-9	1	(4%)
10-19	7	(25%)
20-29	10	(36%)
30-39	4	(14%)
40-49	3	(11%)
50-59	2	(7%)
60-69	1	(4%)
70-79	0	(0%)
80-89	0	(0%)

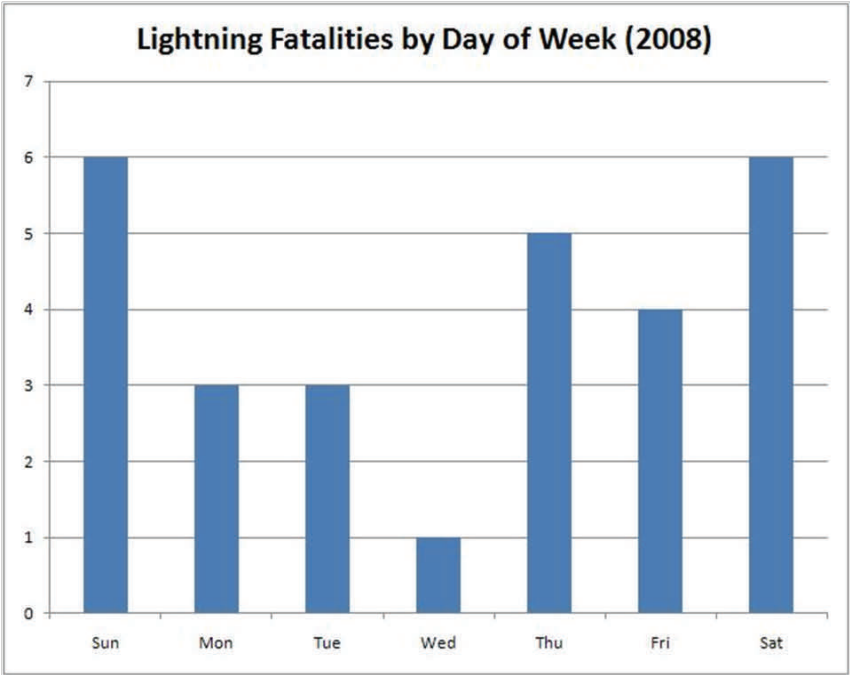
Note: Percentages may not add up to 100% due to rounding.



By Day of Week

In 2008, Saturday and Sunday had the most lightning fatalities with the two days accounting for about 43% of the fatalities.

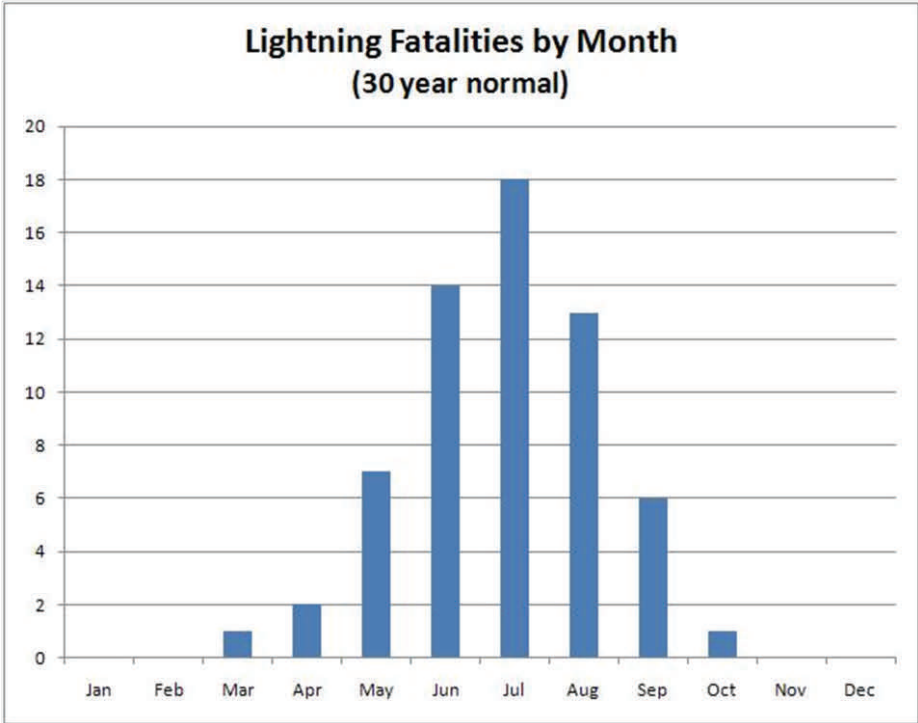
Sun	6	(21%)
Mon	3	(11%)
Tue	3	(11%)
Wed	1	(4%)
Thu	5	(18%)
Fri	4	(14%)
Sat	6	(21%)



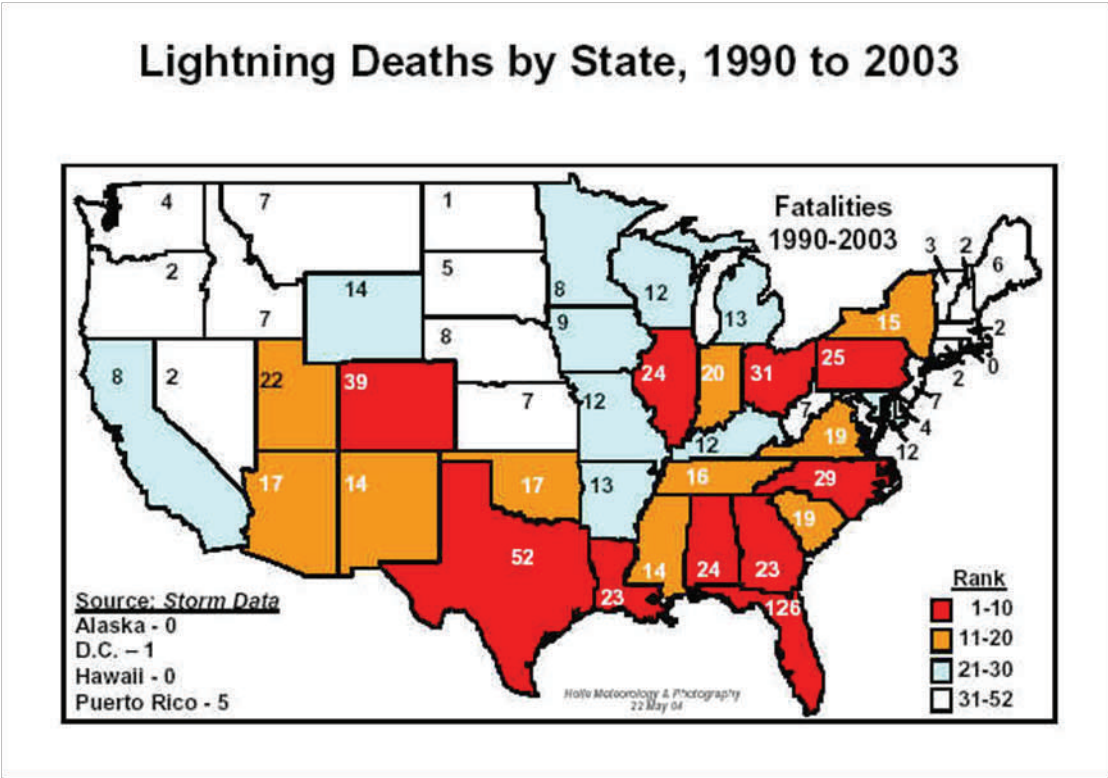
By Month

In 2008, half of the total number of fatalities occurred in July. Typically, the month of July is the peak in summertime activities, the peak in lightning strikes, and the peak in lightning fatalities. Somewhat surprisingly, 2008 had only one lightning fatality after July, and that was caused when a branch from a tree that had been struck by lightning fell on a woman.

	2006	2007	2008	Normal
January	1	0	1	0
February	0	0	1	0
March	0	1	0	1
April	3	1	0	2
May	5	5	2	7
June	10	12	9	14
July	16	10	14	18
August	7	9	0	13
September	4	5	1	6
October	2	2	0	1
November	0	0	0	0
December	0	0	0	0
Yearly Total	48	45	28	62



Note: Normal is based on 30-yr average of 62 deaths per year (1977-2006) multiplied by the average monthly percentage of annual deaths from 1959-1994 as documented in NOAA Technical Memorandum NWS SR-193 with Dec 1961 plane crash fatalities removed from the data.



Lightning casualties for northeast IL and northwest IN (1996-2008)

Date	Time	Location	Age/Sex	Activity	Casualty
5/9/96	1000 PM	Northbrook	Adult male	Walking dog	Killed
5/24/96	145 PM	Chicago Ridge	Adult male	Unloading delivery truck	Inured
5/24/96	445 PM	Cedar Lake, IN	Adult female	Opening car door	Injured
6/17/96	600 PM	Park Ridge	Adult male	Soccer referee	Killed
9/7/96	200 PM	Chicago	9 year old boy	Outside	Injured
9/19/97	300 PM	Carpentersville	Adult male	Changing tire in parking lot	Injured
9/19/97	330 PM	Chicago	13 year old boy	Playing soccer – not raining	Injured
6/18/97	330 PM	Rochelle	Adult male	Near a tree	Injured
5/17/99	1030 AM	LaSalle	5 high school students	4 th floor near open window when lightning struck a nearby flagpole	Injured
5/21/00	330 PM	Palos Heights	Adult male	Outside when lightning struck a nearby metal pole	Injured
7/22/01	400 PM	Maywood	Adult woman	Walking through Miller Meadow	Killed
7/23/01	430 PM	Calumet City	Adult male	Sitting on front porch	Injured
8/9/01	750 PM	Capron	16 year old boy	Golf course	Killed
6/3/02	500 PM	Buffalo Grove	2 adult males	On baseball field	One killed, one injured
6/25/02	330 PM	Joliet	Adult male	mail carrier injured when lightning struck a power pole and traveled through ground to metal mail box.	Injured
6/25/02	200 PM	Crown Point, IN	2 adult males	working on piece of drilling equipment	Injured
4/4/03	330 PM	O'Hare Airport, Chicago	Adult male	Outside when lightning struck a nearby plane	Injured
7/3/03	300 PM	Elgin	Adult male	Working on a roof	Injured
7/8/03	1230 PM	Oglesby	17 year old boy	In a parking lot	Injured
8/17/04	515 PM	Plainfield	Adult male	Outside	Injured
5/11/05	700 AM	Chicago	Adult male	Unknown	Injured
6/26/05	215 PM	Roselle	Adult male and 15 year old boy	In back yard	Boy killed, man injured
7/21/05	250 PM	Valparaiso, IN	Adult male	Working at fair-grounds	Injured
6/2/06	330 PM	Elgin	2 adult males	Taking cover under trees at golf course	Both injured, one died 2 days later
8/2/06	930 PM	Chicago	Young girl	Watching TV when lightning struck house	Felt numbness in arm
8/2/06	940 PM	Tinley Park	Adult woman	Washing face when lightning struck house	Mild shock in arm
5/26/07	530 PM	Gary, IN	15 year old boy	Standing near a tree	Injured
10/18/07	700 PM	McCook	14 year old boy	Riding bike	Injured

Conclusions;

90% of the lightning victims were male

36% were young people, age 18 and under

86% of lightning casualties were from May through August, with June leading the way – 5 injuries and 4 fatalities

75% of lightning casualties occurred between noon and 700 PM

Most were outside involving work or recreation

These lightning casualty statistics come from the NOAA/NWS publication StormData. The primary source of lightning casualty information for StormData is newspaper articles. Studies in Florida and Colorado indicated lightning casualties in StormData may be underreported by 30 to 40 percent.

Lightning safety;

- Plan ahead and avoid dangerous lightning situations. Check the latest forecast before going outdoors for extended periods. Watch for storms and seek shelter when storms approach.
- Get inside a substantial building when lightning threatens. Picnic shelters, baseball dugouts, gazebos, and tents may keep you dry for a few minutes, but they do not offer protection from lightning.
- In a home or building, avoid using a corded telephone (cell phones are okay) or electrical appliances during an active thunderstorm. Do not take a shower. Metal wiring and pipes can conduct electricity.
- You are safe from lightning in an enclosed metal vehicle. (The steel cage provides protection, not the rubber tires.) Convertibles and golf carts are unsafe in lightning storms.
- Lightning is more likely to strike tall objects. If caught outdoors and no shelter is available, find a low spot away from trees, poles and fences. Standing out in the open is dangerous. If you are in the woods, seek shelter in a low area, in a clump of smaller trees or brush, rather than near lone tall trees.
- If you are swimming or boating, get out of the water immediately.



Remember, When Thunder Roars, Go Indoors!

For more information, go to www.lightningsafety.noaa.gov

Recent Changes and News from the Chicago NWS Office

by Andy Boxell, Meteorologist Intern

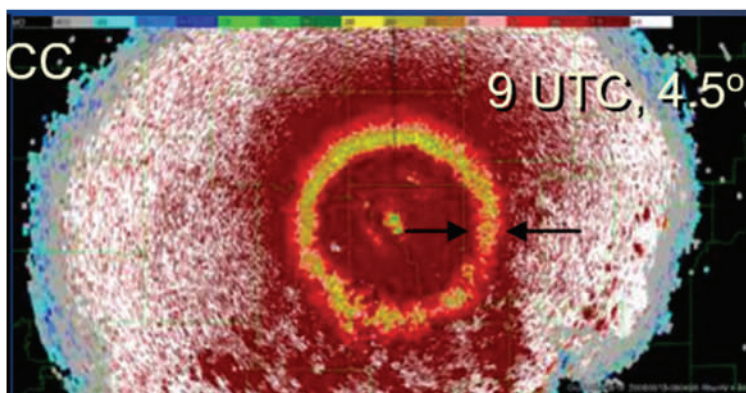
Office Reconfiguration

With limited space for a litany of computer monitors, information displays, and other important equipment, finding an office configuration that maximizes the space in our operations area is always a challenge. Early this month, the Chicago NWS office underwent a complete reconfiguration of the area where all forecasting and warning operations take place. This move is the completion of a nearly 6 month long process of brainstorming meetings, where members of the staff presented and considered hundreds of different ideas. It is our hope that the new office layout will maximize the flow of information between members of the staff who are working, especially during dangerous weather situations.

Along with the rearranging of office furniture, the office will also be integrating a Situational Awareness Display (SAD) into the operations area. This will consist of a series of television and computer monitors that will show up-to-date weather information that is important for forecasters during severe weather. The SAD can be used to show countless sources of information; these may include different radar displays, recent weather maps and analyses, and even our partners with the local media. Since the weather is always changing, it's important that forecasters who are issuing warnings always have the latest information at hand!

Dual-Polarization Radar

Last month, National Weather Service Headquarters released a timetable for an important upgrade to all Doppler radars around the country. Currently, all NWS Doppler radars (and most other weather radars) transmit their electromagnetic pulses with the electric field oriented horizontally. If only one orientation can be used, this is the best choice, since falling raindrops tend to "flatten out" due to air resistance. However, this upgrade will make the radar "dual-polarized", allowing it to transmit in both the horizontal and vertical orientations. This has several important advantages, especially for an area like northern Illinois and northwest Indiana. Among other things, dual-polarization will allow meteorologists to better differentiate between different types of precipitation, such as rain, snow, sleet, and hail, as well differentiate between meteorological and non-meteorological targets such as birds and insects. This will, in turn, make the estimation of rainfall from radar much more accurate, increasing the accuracy of flood and flash flood warnings, and helping us better protect lives and property across the region. Chicago will be one of the first radar sites to receive the upgrade, currently slated for early September, 2010. As this date gets closer, be sure to be on the lookout for more information on dual pol radar!



The image to the left shows the Correlation Coefficient display, one of the new radar products that will be available with dual-pol radar. In this case, the yellow "ring" shows an area of melting precipitation.

Staffing Additions

Summer of 2009 will also be an exciting time for personnel changes around WFO Chicago. Yours truly (Andy Boxell) was hired in late spring of this year as an addition to the office staff, with my official start date in early June. I am a 2009 graduate of Valparaiso University and have spent the last year as a Student Trainee working at the National Weather Service offices in Louisville, KY, North Webster, IN, and finally here in Chicago. As an entry level meteorologist, I will work with the forecasters and hydro-meteorological technicians as I continue to learn about and practice forecasting techniques, assist with outreach events, and help with office projects. This is a great opportunity to practice and continue to learn about the science that I love, while being able to serve the nearly 10 million people in our County Warning Area. I am thrilled to be here!

This summer we will also have 3 student volunteers working several hours each week at the office. These students are all meteorology majors from area universities, and will assist with outreach events, office research projects, as well as shadow forecasters during their shifts. This is a great opportunity to learn about the Weather Service from the inside out, and we're excited to have them!

Finally, two students who are part of the NWS Student Trainee program will be joining the office staff in August, 2009. The Student Trainee is a paid position that allows selected students to both work part-time for the NWS while completing school. If a student shows satisfactory work and completes at least 640 hours of work before graduation, then he or she is eligible for a permanent position at a forecast office. As with our student volunteers, both Student Trainees will be excellent additions to Team Chicago!

Got a Weather Question? Ask the Chicago National Weather Service Office



A few weeks ago, we asked if any of our users had any questions they would like to see answered in our newsletter. Well we have answered a couple of them for you. If you would like to ask a question and see it in a future newsletter, send your questions to: w-lot.webmaster@noaa.gov.

I live in western DuPage County and over the past few summers have seen storms around the DeKalb area fizzle out before making it here. Other times I see storms come from the east along the lake breeze. Since I see it help and hinder storms, my question is how does Lake Michigan affect thunderstorms?

Scott Fisher

Scott,

Lake Michigan does have a big influence on weather in the Chicago metro area. Cool air is heavier or more dense than warm air. During the spring months, when air over land areas is generally warmer than over the lake, the large pool of cool dense air over the lake spreads inland. The leading edge of the cooler air is known as the lake breeze. It can act like a cold front, displacing the warm air and forcing it to rise. Under some circumstances, if there is sufficient moisture and instability in the warm air mass, thunderstorms can form along the lake breeze. These thunderstorms tend to reside near the lake breeze and move very slowly inland. This only occurs when the atmosphere is moist and unstable and there is strong convergence of air. Therefore, the prevailing wind should be from the west or southwest to maximize the convergence along the eastward moving lake breeze.

If the prevailing wind is from the east, the cool, stable, lake-modified air tends to move farther inland and the marine layer will generally be deeper. Under these conditions, thunderstorms moving in from the west can weaken as they encounter the cooler more stable air.

However, there can be many other reasons for storms to weaken as they approach Chicago (or any location). Thunderstorms are often driven by instability which is maximized during the warmest part of the day – the afternoon hours. If strong thunderstorms develop in the afternoon near the Mississippi River in the heat of the afternoon, they often weaken during the evening hours as they move east, regardless of the lake influence. Other times a warm unstable air mass may be in place over the Mississippi Valley while the atmosphere may be more stable to the east over the Great Lakes and Ohio Valley. Again strong thunderstorms can die out as they move into this less favorable environment.

* * * * *

I live in Naperville and it seems to me that a lot of weather systems like to divide along I-88 and go northeast towards the Evanston area and the rest moves southeast through Romeoville and towards northern Indiana. Meanwhile, Naperville's weather seems relatively less severe. One example I am thinking of is the mesoscale Convective complex last year (August 4) that spawned the F0 and F1 tornadoes in West Chicago, Bartlett, Wheaton, Bolingbrook, and the F2 in Indiana. Looking at radar images your office posted in the following days, the system seemed to split or at least weaken in my area with just estimated 25-30 mph winds and heavy rain, while my parents house in Bolingbrook and my place of employment in West Chicago were just blocks from the tornadoes. I have noticed similar patterns with other systems so I was I was wondering if there were features in that east/west line along I-88 that affects these systems.

Chuck Korponya III

Chuck,

Thunderstorms are small scale weather features. There are a lot of factors that cause some storms to be more severe than others, even though they occur in a similar atmospheric environment. Understanding and forecasting these small scale features is one of the biggest challenges in the science of meteorology. We actually get this same question from a lot of people in a lot of locations around northern Illinois and northwest Indiana – “Why do the storms always split and go around my town?” If there are corridors where severe weather is more or less frequent, we do not have any studies documenting this, nor do we have any scientific reasoning as to why this would occur. Northeast Illinois and northwest Indiana are relatively flat with no significant terrain features that would influence thunderstorms. The only local feature that could impact thunderstorms in this area would be Lake Michigan. But there is no reason that the lake would influence Naperville differently than other nearby suburb. If you looked at a long history of severe weather in the Chicago area, I would suspect that Naperville gets hit just as hard and as frequently as other suburbs, in the long run.

The complex of storms last August developed several small circulations, or mesocyclones. Some of these were fairly long lived. The most intense winds and tornadoes were focused along the paths of these mesocyclones. The one that produced tornadoes at Bolingbrook, Orland Park, and northwest Indiana may have been caused when the line of storms interacted with the lake breeze. But we don't have a good understanding of why the other mesocyclones formed where they did.

To see a write-up on the August 4th, 2008 event, [click here](#).